Name ..... ID ..... Section ..... Seat No .....

Sirindhorn International Institute of Technology
Thammasat University

Final Exam: Semester 1, 2012

Course Title: ITS323 Introduction to Data Communications

Instructor: Steven Gordon

Date/Time: Monday 15 October 2012; 9:00–12:00

Instructions:

- This examination paper has 21 pages (including this page).
- Conditions of Examination: Closed book; No dictionary; Non-programmable calculator is allowed
- Students are not allowed to be out of the exam room during examination. Going to the restroom may result in score deduction.
- Students are not allowed to have communication devices (e.g. mobile phone) in their possession.
- Write your name, student ID, section, and seat number clearly on the front page of the exam, and on any separate sheets (if they exist).
- Assume bits are ordered from left to right. For example, for the data 00001111, the first (1st) bit is 0 and the last (8th) bit is 1.
- Assume the speed of transmission is 3×10^8 m/s
- Reference material included at the end of the exam may be used.

ITS323 Final Exam Hints

- 9 questions, each with multiple parts
- 100 marks in total
- 1 question: fill in the blanks
- 8 questions: general questions, calculations, …
- Topics: PCM, Data Link Control Protocols (flow control, ARQ), Switching, Routing, Internet, Transport Protocols, Application Protocols, Assignment
    - NOT covered: Digital Data Communication Techniques, Multiplexing, LANs
- Only PCM from Signal Encoding Techniques may be covered; the other topics from Signal Encoding Techniques were in the midterm (and hence not in final)
- Question(s) related to the assignment may be in the final. However they will be basic questions that all groups should be able to answer, even if you obtained a low score on the assignment.
- Use past exams and quizzes for study.

Reference Material

Selected well-known ports:

- FTP 20 and 21
- SSH 22
- Telnet 23
- SMTP 25
- DNS 53
- HTTP 80
- HTTPS 443

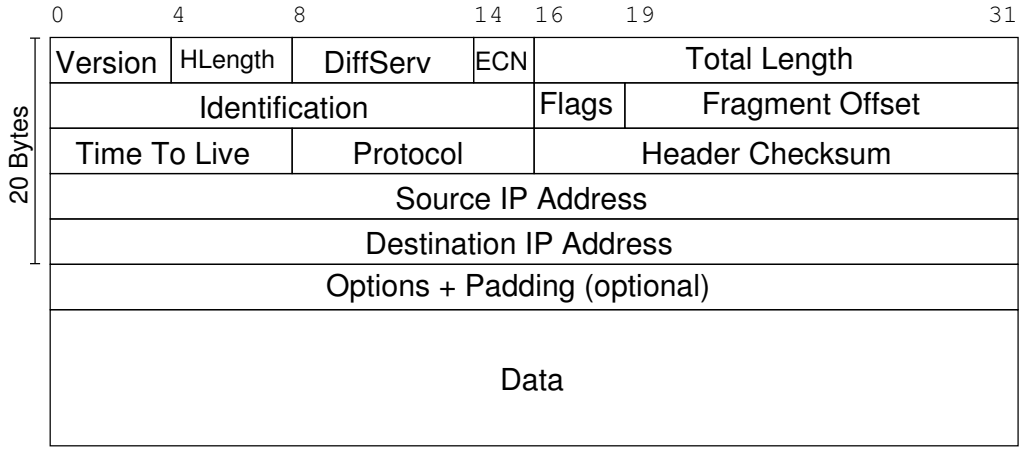

Figure 5: IP Datagram Format. Flags: Reserved, Don't Fragment, More Fragments

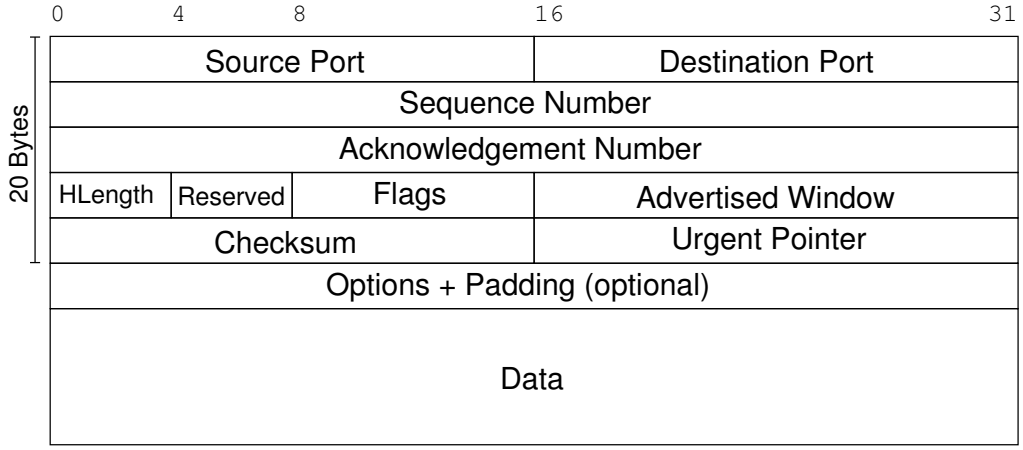

Figure 6: TCP Segment Format. Flags: CWR, ECE, URG, ACK, PSH, RST, SYN, FIN

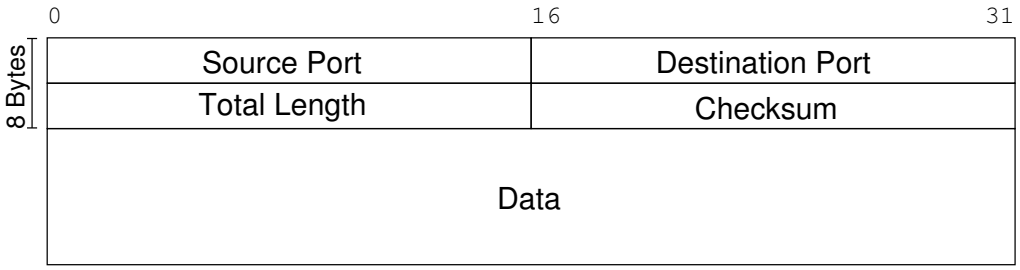

Figure 7: UDP Datagram Format

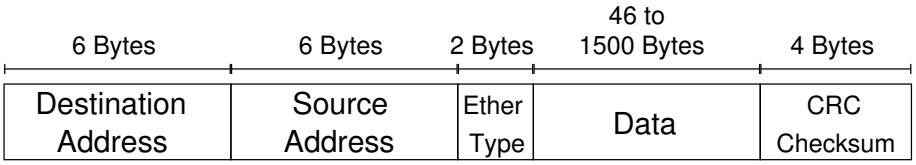

Figure 8: Ethernet Frame Format

Selected Protocol numbers:

- 1 ICMP
- 6 TCP
- 17 UDP

Selected HTTP Status Codes:

- 200 Ok
- 304 Not Modified
- 401 Unauthorized
- 404 Not Found